

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

The collective voice of unions and workplace training in Italy: new results from mixed methods

This is the author's manuscript

Original Citation:

Availability:

This version is available <http://hdl.handle.net/2318/1655785> since 2023-04-12T13:11:29Z

Terms of use:

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

DISCUSSION PAPER SERIES

IZA DP No. 12712

**Workplace Unionism, Collective
Bargaining and Skill Formation: New
Results from Mixed Methods**

Fabio Berton
Anna Carreri
Francesco Devicienti
Andrea Ricci

OCTOBER 2019

DISCUSSION PAPER SERIES

IZA DP No. 12712

Workplace Unionism, Collective Bargaining and Skill Formation: New Results from Mixed Methods

Fabio Berton

*University of Torino, IZA and LABORatorio
R. Revelli*

Anna Carreri

*University of Verona and University of Has-
selt*

Francesco Devicienti

*University of Torino, Collegio Carlo Alberto,
IZA and LABORatorio R. Revelli*

Andrea Ricci

INAPP

OCTOBER 2019

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Workplace Unionism, Collective Bargaining and Skill Formation: New Results from Mixed Methods¹

Among the steps to improve a country's competitiveness, several commentators and international institutions include a general emphasis on deregulation and decentralization of industrial relations. In this paper, we contribute to this debate by studying whether and how firm-level unionism and collective agreements affect workplace training, a key ingredient to competitiveness. Theory provides inconclusive predictions on the various channels and processes through which firm-level industrial relations may affect workplace training. Quantitative and qualitative analyses, when used in isolation, have also proved insufficient for an adequate account of the various factors at play. This is where our paper mostly contributes. In the spirit of opening the "black box" of firm-level unionism and collective bargaining, we mix together quantitative and qualitative strategies. Our results suggest that workplace unionism, and especially decentralized collective agreements, favor workplace training in subtler and often more dynamic ways than commonly understood.

JEL Classification: J24, J52

Keywords: workplace training, industrial relations, firm-level bargaining, Italy

Corresponding author:

Fabio Berton
University of Torino
Department of Economics and Statistics
Lungo Dora Siena, 100/A
10153 Torino
Italy
E-mail: fabio.berton@unito.it

¹ We thank Christine Trampusch and the participants to the workshop on "Skill mismatch: measurement issues and consequences for innovative and inclusive societies" (University of Torino, June 2017), to the conference on "Reassessment and Perspectives of Labor Policies" (University of Roma "Roma Tre", December 2017), the SISEC Conference (Catholic University of Milan, January 2018), the Conference in Memory of Marco Biagi (University of Modena and Reggio Emilia, March 2018) the Workshop on Labor Economics (University of Trier, April 2018), the SASE Conference (Doshisha University, Kyoto, June 2018) and to the seminars held at LISER (Esch-sur-Alzette, November 2017) and at the Department of Economics and Statistics of the University of Torino (December 2017) for helpful comments and suggestions. The University of Torino and Compagnia di San Paolo Bank Foundation with projects "Skill mismatch: measurement issues and consequences for innovative and inclusive societies" and "Productivity, welfare and decentralization" are kindly acknowledged for financial support. We also thank the National Institute for Public Policy Analysis INAPP for data support. The usual disclaimers apply.

1. Introduction

Intangible assets such as human capital and industrial relations are important sources of economic growth. Knowledge supports long-run competitiveness (Dostie, 2018; European Commission, 2008; 2010; 2016; Quintini, 2014), and a significant part of the whole stock of skills and experience is acquired from vocational or on-the-job training (Cedefop, 2019a; 2019b). Workplace training, in turn, is often a matter regulated under collective agreements, both at the national and at the firm level, and is more generally affected by unions' activity (Cooney and Stuart, 2012; Heyes and Stuart, 1998). Workers' organizations, on the other hand, may also affect efficiency and competitiveness directly, either in negative (FitzRoy and Kraft, 1985; 1987; Oswald, 1985) or in positive ways (Freeman and Medoff, 1979; 1984; Rogers and Streeck, 1995; Tüselmann et al. 1987).

Among the steps to improve a country's competitiveness, several commentators and international institutions have increasingly included a general emphasis on deregulation and decentralization of industrial relations (e.g., OECD, 2015), seen however rather skeptically by other scholars (e.g., Eichenberger and Trampusch, 2012; Estevez-Abe et al., 2001). In this paper we aim at contributing to this debate by studying how firm-level industrial relations affect workplace training decisions in a country – Italy – that, starting in the 1990s, has progressively shifted its collective bargaining process from the central/sectoral level to the local/firm one, arriving in 2011 to introduce a law that allows firm-level decisions to opt out of national laws and of sectoral collective agreements.

Firm-level union activity may affect workplace training in many ways, as we set up to review in the next section. In principle, different channels might be at play, some having positive while others having negative effects on firm-sponsored training programs. Generally speaking, one might expect an overall negative effect to prevail, whenever the opportunistic and conflictual behaviors often associated to the so-called “monopoly face” of unions are dominant. On the contrary, a positive impact of workplace unionism and collective bargaining is likely to emerge whenever the more collaborative and participative face, the so-called “collective voice” of unions, dominates (Freeman and Medoff, 1984). Theory alone is clearly insufficient to settle the issue; this is why we embark, in what follows, in a thorough empirical analysis.

We do so by combining two different empirical strategies. Our first strategy is based on econometric estimates of the relationship between workplace union activity and firm-sponsored training. We rely on a firm-level survey providing a rich set of information on training activities, workplace unionism and firm characteristics. The data are longitudinal, enabling us to control for firm time-invariant unobserved characteristics via firm fixed effects. A noticeable feature of our data is that we have diverse measures of firm-sponsored training, ranging from the share of workers undergoing training to measures of the monetary cost of the training initiatives. The latter provides us with a measure of the quality of training, a type of information that is rarely available in other data sets (an example is Kriechel et al., 2014).

While the econometric analysis provides strong evidence of a positive relationship between workplace union activity and firm-sponsored training, it is less well-equipped to provide an adequate account of the various mechanisms at play. This is why we rely on another, qualitative in nature, empirical strategy. Put it simply, if observational available data cannot provide us with a fuller account of the various processes that enable, or rather prevent, union activity to have an impact on firm training, why not ask directly to the people that are repeatedly involved in such processes to share with us their experiences?

We believe that the combination of quantitative and qualitative analyses is where our paper mostly contributes to the literature, in the spirit of opening the “black box” (Beach, 2019) of firm-level union activity and collective bargaining. In this respect, a distinctive strength of our *mixed-methods* approach is that we can make progress in disentangling the effects of the presence of workplace unions *per se* from those arising upon the signing of a formal firm-level agreement. Indeed, the survey data used for the econometric analyses allow us to observe whether or not a union body with workers’ representatives has been set up at the firm level, and whether or not a firm-level agreement is in place at any survey year. Similarly, our qualitative analysis is aimed at unravelling, from the experiences of the key informants involved, the separate roles of firm-level collective bargaining from the more general effects arising out of workplace representation and union activity.

Following Johnson et al. (2007: 123), “*mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative*

and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration". More specifically, we apply a sequential research design. First, the application of state-of-the-art econometric techniques to a large representative sample of Italian companies surveyed over time through an extremely detailed questionnaire, suggests that the existence of a firm-based collective agreement enhances the probability that a worker receives workplace training and makes the per-worker and per-trainee expenditure on training grow. Second, thematic qualitative analyses of twenty-five semi-structured interviews to key informants of industrial relations, training programs and hiring strategies, allows us to identify key dimensions of the relationship between workplace unionism, collective bargaining and skill formation, and the underlying processes. Our joint reading of the quantitative and qualitative analyses suggests that workplace unionism, and especially decentralized collective agreements, favors workplace training in subtler, often more dynamic, ways than commonly understood, and highlights a number of hitherto understated policy implications.

Our paper proceeds as follows. In section 2 we provide the reader with a conceptual framework and a literature review, followed in section 3 by a short account of Italy's institutional background and the evolution of the rules governing its industrial relations. In section 4, we describe the data and our twofold empirical strategy. Section 5 comments the results of the quantitative analysis, while section 6 focuses on the finding of qualitative analysis. Section 7 offers a summary, joint reading of our mixed-methods analysis, and provides some concluding remarks.

2. Conceptual framework and literature

Union activity and collective bargaining at the firm level may have a bearing on the accumulation of human capital, with potential benefits for both workers and firms. Our paper focuses on the type of human capital accumulation that occurs via firm-level training initiatives, and hence for the most part specific to the firm where the training is offered.

The literature posits that workplace unionism and collective bargaining may have both positive and negative effects on the amount and quality of firm-sponsored training. A typical situation where the negative effects are more likely to manifest themselves is when workers' representative, and the local unions' officials often providing them with external support in workplace industrial relation issues, are rather oriented towards opportunistic, rent-capturing behaviors, as described by the hold-up literature.² Whenever a firm's investments in physical or human capital have a sizable "sunk cost" component, and contracts are incomplete (e.g., it is possible to renegotiate wages and other working conditions *ex-post*, at any time after the investment has taken place), a hold-up problem arises (Grout, 1984). In this case, the firm invests sub-optimally, or may even completely give up the initial investment plans, if it anticipates that a monopolist union may, through higher future wage claims, capture the returns of the investment being contemplated today (Card et al., 2014; Cardullo et al., 2015; Cavanaugh, 1998; Hirsch, 1991). More generally, workplace unionism may exert a negative impact on the quantity and quality of firm-sponsored training whenever conflictual behaviors are prevalent within the firm, with the consequence of reducing the resources (including the financial ones) available for the training investment.

However, there are also various channels through which workers' representatives and unions active at the workplace may have a positive impact on firm-sponsored training programs. First, workers' representatives, possibly assisted by local unions, may provide valuable information on skill gaps and mismatches and on adequate interventions, as also suggested by the literature emphasizing the so-called "collective voice face" of unionism (Freeman and Medoff, 1984; McGuinness and Ortiz, 2016).

Second, union activity at the firm may promote long-term employment relationships (Boockmann and Steffes, 2010; Busemayer and Trampusch, 2012; Estevez-Abe et al., 2001; Hirsch et al., 2010; Pfeifer, 2011) and bolster the integrity of internal labor markets (Harcourt and Wood, 2007), thus creating incentives for long-run human capital investments (Acemoglu and Pischke, 1999; Lazear, 2009). Both the worker and the firm

² Rents may emerge for a number of reasons, including monopsonistic labor markets (Manning, 2006), labor market frictions (Diamond, 1982a; 1982b; Mortensen, 1970; Pissarides, 1985) and also non-competitive markets for goods.

are more likely to invest in firm-specific human capital when the employment relation is expected to be long-lasting. By providing them with a “collective voice”, unions typically reduce the exercise of the “exit” option by dissatisfied workers. Collaborative workplace unions may also contribute to a positive corporate climate, and to the firm’s business longevity.³ Both mechanisms contribute to extend the time horizon of the employment relations and the willingness of firms and workers to accumulate specific human capital.

Third, and relatedly, a positive effect is also to be expected if unions aim at defining an ex-ante “fair” contractual division between labor and capital (“rent-sharing”) of the future returns of the investment in human capital. In other words, workplace unionism may prevent a hold-up problem to arise from the worker’s perspective (Hashimoto, 1981). The hold-up refers here to the worker being reluctant to invest in firm-specific human capital fearing that the returns of her investment might be, partly or even entirely, captured by the firm. As stated by Parent (2004: 38), *“by writing a contract in which it is specified that workers get a certain percentage of profits, workers can feel more confident that they will not be held up ex post”*. In this case is not just the presence of workplace unions per se, but rather their ability to write binding contracts, e.g., via firm-level collective agreements, that matters for the neutralization of the hold-up problem.

Forth, the payment of wage bonuses – typically regulated by firm-level agreements – may be an incentive device to promote efficiency in the production process (Katz and Ziderman, 1990; Leuven, 2005), while other non-wage dispositions set by firm-level agreements may prevent unions’ opportunistic behaviors and other actions that limit workplace flexibility, ultimately freeing resources to “invest into the future” (Devicienti et al., 2017; Green and Heywood, 2011). More generally, firm-level agreements can constitute a credible instrument to promote and implement “virtuous exchanges” between workers and the firm, with today’s sacrifices (in terms of wages, working time, labor organization) being compensated by higher investments for the future.

Firm-level collective bargaining is of course only one of the modalities through which workplace union activity may have an impact on a firm’s choices, including those

³ Addison et al. (2004) however point to a positive relationship between the presence of works councils and the probability of plant closures in Germany, in line with the effects of Australian unions reported in Brown and Heywood (2006).

related to training. We may think that it constitutes the *formal* tool, in the sense that it is typically necessary to “sit at the negotiating table”, present a union platform, bargain over it and, finally, sign a legal contract. Other modalities are represented by all forms of collaboration, participation and involvement, often at an *informal* level (e.g., meetings, assemblies and other daily exchanges between the management and the workers or their representatives), as well as all other actions that directly or indirectly create a “corporate climate” conducive to investments in (human) capital.⁴

When the firm and the union jointly discuss and bargain over the various aspects of the employment relation, the negative implications related to the “monopoly face” of unions are more likely to be contained. In this respect, one may argue that the presence of a firm-level labor contract has a double significance. On the one hand, it signals that the “voice” option has been formally expressed by workers, reducing conflicts, increasing trust and cooperation among the counterparts, and possibly contributing to an overall better working environment. On the other hand, the signing of a firm-level agreement commits the union to a predetermined set of contractual rules on wage and labor organization aspects, reducing uncertainty and unions’ ex-post opportunistic behavior. Overall, one may expect that training opportunities within the firm are enhanced by the workplace union’s engagement in the processes and outcomes of collective bargaining. Keeping separate the mere presence of workplace representation and unions, on the one hand, and the signing of a formal firm-level agreement, on the other, is therefore important for a fuller understanding of the various factors at play, as discussed above, and is a distinctive feature of our analysis.⁵

We finally turn to the available empirical literature and notice two aspects. First, most of the papers on the effects of workplace unions on training refer to the experiences of the German works councils. The reported effects are generally positive on training incidence and intensity (Stegmaier, 2012), on financing (Kriechel et al., 2014) and on participation (Allaart et al., 2009; Bellmann et al., 2018). There are also a few papers

⁴ In addition, the presence of a firm-level agreement implies responsibilities also on the employer’s side, and not only from workers’ representatives.

⁵ In order to sign a firm-level agreement in Italy, the presence of workplace unions (*RSA* or *RSU*) is *de facto* necessary, although not sufficient, in case the bargaining process, for instance, does not result in any agreement, or the workers’ representatives are not interested (or strong, or wise enough) to start a bargaining process.

reporting positive effects for UK workplace unions (Booth et al., 2003; Green, 1993; Green et al., 1999). Outside these countries, the empirical literature is quite scant. Second, only very few contributions disentangle the separate effects of workplace unionism and firm-level collective bargaining. Kriechel et al. (2014), who report of a positive interaction between works councils and collective bargaining on training, is one of the few examples that we are aware of. Our paper intends to contribute on both aspects.

3. Institutional background

Since the early nineties the country's fairly centralized system of industrial relations have seen a gradual, if slow, process towards decentralization of collective bargaining, increasing over time the scope for firm-level agreements to derogate with respect to the dispositions set by sector-wide collective bargaining. The main changes were set in 2007 and 2011. In 2007, Law no. 247 ruled that performance pays were subject to a significantly lower tax rate. This created an incentive for workers and firms to sign decentralized, mostly firm-level, agreements to take advantage of the more favorable tax rate. A deeper change occurred in 2011, when Law no. 148 – at its article 8 – ruled that firm- and local-level collective agreements could derogate *in peius* to both the labor law and the national collective contracts, albeit only for non-wage related matters. In the political and economic turmoil following the sovereign debt crisis, Law no. 148/2011 was conceived by the Berlusconi government as an attempt to fulfill the request of major labor market reforms – and more precisely of a harsh reduction of the Italian employment protection legislation – included in the well-known letter to Italy signed by the incumbent and prospective governors of the European Central Bank (Draghi and Trichet, 2011). While Law no. 148/2011 was deemed insufficient to that purpose (Sacchi, 2015), it nonetheless introduced in Italy – at least formally – the possibility for employers to opt out from (national) collective agreements.⁶

⁶ In practice, according to data from the National Institute for the Evaluation of Public Policies (INAPP), for only less 3% of firms have made use of such opting-out in 2015.

Italy is therefore currently characterized by a two-tier bargaining system, with a dominant sectoral tier and a supplementary decentralized tier where bargaining is usually carried out at the company level.⁷ The main objectives of the sectoral agreements (*National Collective Labor Agreements*, NCLAs) are to protect real wages and to set common economic and normative conditions for sectoral workers nationwide. At the decentralized level, it is possible to negotiate performance and productivity-related wage increases. In addition, the second level bargaining may address a number of additional matters, such as working hours, employment, training, labor organization and union relations, in order to gain flexibility for organizational changes and competitiveness. Application to all workers in the firm of the conditions arrived at through bargaining at the decentralized level is the standard practice (Cella and Treu, 1999). Second-level bargaining is generally subject to the limits and provisions defined by the specific NCLAs applied in the productive unit.⁸

Italian law gives the workers the right to join a union, engage in union activity and organize a plant-level union representation structure. The main workplace representation body is the so-called ‘unitary workplace union structures’ (*Rappresentanze Sindacali Unitarie*, RSU).⁹ The RSU includes features of works councils (e.g., worker representatives are elected by all employees) but can also be associated with trade union bodies (e.g., worker representatives are usually elected from competing candidates on trade unions lists).¹⁰ Hence, in Italy union and employee representation are entrusted to a single body (single-channel representation), as opposed to a dual-channel system where union

⁷ A territorial level (mostly at the province level) also exists, but is typically confined to particular industries, e.g., construction and agriculture.

⁸ There are no official data on the diffusion and content of decentralized bargaining. Survey data suggest that the coverage is at around 60% of employees and from 15% to 25% of firms (Damiani and Ricci, 2014), with greater incidence in manufacturing and larger firms. A large fraction of second-level agreements (over 60%) contain wage increases related to productivity gains, but agreements dealing with workplace organizational changes, performance-based human resource management practices and employment flexibility are not uncommon, and broadly cover the remaining 40% of cases.

⁹ According to Italian law, workers’ representation can be set up in firms with more than 15 employees, at the discretionary initiative of workers. Hence, not all firms above 15 employees are unionized. Furthermore, the national bargaining system at the industry level can introduce workers’ representation also in firms with less than 15 employees. In our sample of firms with 10 to 15 employees, the share of unionized firms is around 7%, while for firms above 15 employees it is at around 50%.

¹⁰ Many features of Italian industrial relations are similar to those of other countries of continental Europe (see, e.g., Breda, 2015, for France, and OECD, 2004): a multi-tier bargaining; no US-style “certification elections” required for union recognition; workers can be represented by more than a union at the workplace; unions are open-shop.

delegates operate alongside works councils.¹¹ Worker representatives are able to negotiate at the plant level on issues delegated from the industry-wide level, and have rights to information and consultation (D'Amuri and Giorgiantonio, 2015). According to CNEL (2007), issues related to the training of the workforce were covered from 38% (70%) to 67% (88%) of company-level agreements in the period 1998-2004 in firms employing less (more) than 1,000 workers; another 33% (40%) to 78% (67%) were related to qualifications, albeit there is uncertainty about the exact content of the agreements and the data are not representative from a statistical standpoint. Union influence may also be exerted through more informal consultation and involvement practices. This channel is likely to be relevant at the productive-unit level between workers' representatives and intermediate managers – especially in small-medium size firms – though little is known on the spread of such practices (Cerruti, 2011).

4. Data and empirical strategy

Our quantitative empirical analysis is based on the information provided by the *Rilevazione su Imprese e Lavoro* (RIL), a survey conducted by the Italian National Institute for the Analysis of Public Policies (INAPP) on a nationally representative survey of partnerships and limited liability companies operating in the non-agricultural private sector.¹² The RIL survey has a panel structure, with waves occurring every four or five years. For our present purposes, we use the waves conducted in 2010 and 2015.

RIL collects a rich set of information about management and corporate governance, personnel organization, industrial relations and other workplace characteristics. Mostly relevant to our purposes, the survey provides data on whether workers have established any form of workers' representation at the workplace that is legally entitled to participate

¹¹ There is also an alternative plant-level union body (Rappresentanza Sindacale Aziendale, RSA) elected by the members of a particular union. RSUs have tended to replace RSAs, which are usually found in smaller companies and in certain sectors like banking.

¹² For more details on RIL sample design, methodological issues and procedures for requesting data, see: <http://www.inapp.org/it/ril>.

in the firm-level bargaining process (*Union*, for short).¹³ *Union* is a binary indicator, which can be time-varying for any given firm. The survey also allows us to identify whether or not the firm has signed a firm-level agreement (*FLA*) with internal union representatives; *FLA* is a binary indicator, allowed to be time-varying at the level of the firm.¹⁴ Moreover, RIL includes extremely accurate measures of workplace training, ranging from the share of trainees on total employment to the cost of training and its funding source (whether internal to the firm or not). We also have information on other firm personnel policies (such as the use of fixed-term contracts, and the educational and age structure of the workforce), on the firm's productive specialization and business strategies (e.g. innovation policies and export activities), as well as data about the education of the managers/entrepreneurs and the incidence of family ownership. These characteristics may play an important role in shaping both training policies and the nature of industrial relations at the workplace, thus reducing concerns related to omitted variable bias in our analysis.

We focus our attention on firms with ten employees or more. Through this selection criterion, we seek to exclude self-employment (the rate of which in Italy is the highest in Europe) and firms whose employees are the owner's household's members. In addition, we expect this threshold to exclude firms with much unstructured recruitment and training policies. In order to drop outliers from the sample, we also exclude the top 0.5% of firms in terms of per-employee training expenditure. The resulting sample size is close to 4,000 firms, observed twice over our survey rounds.

On such sample, we apply two distinct estimation strategies. The first one, that can be considered a baseline, is a standard pooled OLS specification of the following type:

$$Y_{jt} = \beta_0 + \beta_1 Union_{jt} + \beta_2 FLA_{jt} + \beta_3 X_{jt} + \varepsilon_{jt} \quad (1)$$

¹³ In accordance with the institutional framework presented in section 4, we take as an indicator of unionization the presence of either RSUs or RSAs at the workplace.

¹⁴ A "union" is, in our quantitative analysis, the mere existence of a workplace body of workers' representatives (RSU/RSA, see above). They are workers themselves, and not necessarily professionals of industrial relations or delegates of national-level unions, although strongly linked to the latter. Non-workplace unions (e.g., regional or national bodies) keep constantly in touch with RSU/RSA, provide them with the needed know-how and support. Moreover, the non-workplace representatives often take part to the firm-level bargaining process.

where j is the firm, $t = \{2010, 2015\}$ is the survey wave, Y stands for one of our five training measures: i) whether or not the firm is undergoing any training initiative at time t , ii) the share of trainees on firm's total workforce, iii) whether the cost of training is funded by the firm, iv) (the log of) per-employee training cost and v) (the log of) per-trainee training cost.¹⁵ X is a set of (potentially time-varying) controls including workforce composition (share of women, of blue-collar workers, of temporary contracts, of young workers, of workers with a tertiary degree and of those with a secondary one), firm's characteristics (manager's or owner's educational attainment, whether the firm is a family-owned one, sales per capital, whether the firm sells at least part of its output abroad, net worker turnover, firm's age, size and sector of activity), regional and year fixed effects.¹⁶ The condition for the unbiased identification of the causal effects of interest (β_1 and β_2) is that the idiosyncratic component ε_{jt} is orthogonal to $Union_{jt}$ and FLA_{jt} , conditional on X_{jt} . In order to make this identification condition less binding, we take advantage of the panel structure of the data and also estimate a firm fixed-effect (FE) model of the following type:

$$Y_{jt} = \beta_0 + \beta_1 Union_{jt} + \beta_2 FLA_{jt} + \beta_3 X_{jt} + \mu_j + e_{jt} \quad (2)$$

where μ_j captures a firm's unobserved time-invariant characteristics (e.g., quality of the management and firm culture) that might correlate to both training activities and the propensity to set up a workplace union or sign a collective agreement. E.g., was management quality positively correlated with both $Union_{jt}$ and Y_{jt} , the parameter of interest β_1 would be overestimated in model (1), but not in model (2).

Table 1 provides some descriptive evidence. Workplace worker's representation is present in around 20% of firms, while the share of firms with a decentralized agreement is at around 10%. Both variables appear to be rather stable during the sample period. The share of firms undergoing any training initiative is 44% in 2010, increasing to 58% five years later. All the measures of training intensity, with the exception of per-trainee

¹⁵ Non-training firms are assigned a 1-Euro expenditure on training and are thus kept in the estimation sample.

¹⁶ Appendix C provides the details of the variables' definitions.

expenditure, exhibit an increasing path. Namely, total expenditure grows from around €4,500 to more than €6,200 (+38%), while per-employee expenditure from €98.5 to €123.3 (+25%) and the share of trainees passes from 23% to 39%. This seems to suggest that no relationship exists between training and decentralized bargaining. Our analyses, however, show that this is not the case.

In spite of the quality of the survey data, and our ability to examine the separate role of union presence and firm-level collective bargaining, the resulting quantitative evidence has only a modest potential in terms of explanatory capacity. In other words, at best, we would know whether there is a causal relationship between firm-level unionism and bargaining and workplace training activities, with very limited knowledge on the underlying processes. This is why, in order to explain the quantitative findings and to go into more details in understanding the relationship between training, on the one hand, and workplace union and firm-level collective bargaining, on the other, we have adopted a sequential explanatory research design. Precisely, we have run twenty-five semi-structured interviews with key informants whose professional positions give them extensive and detailed knowledge about the processes through which unions intervene on workplace skill formation issues. The list of interviewees is heterogeneous and includes: seven union representatives from the three largest trade unions in Italy actively involved in decentralized collective bargaining; two representatives of the Italian employers' federation, who are actively involved in firm level bargaining; five human resource managers from companies with best practices in terms of training policy and industrial relations and where i) there is decentralized collective bargaining ii) there is a well-defined personnel selection policy; five people in charge of agencies which provide firms with continuing vocational training, also through the access to external resources via the *fondi interprofessionali*; three experts on skill mismatch and training; one person in charge of a private employment agency; one person in charge of a public employment center; one worker in charge of the training within his company. At the time of the interviews in 2016, they all operated in the secondary and tertiary sectors of a large Italian region, namely Veneto. To protect their privacy, we concealed company names and other identifying details in our analysis.

Interviews were carried out starting from the following topic areas, the comprehensiveness of which was designed in order to leave the largest freedom of discussion to the respondents: interviewee's professional experience on skill mismatch both considering the analysis of skills gaps and the organization of (continuing) vocational training; firm-level collective bargaining and other channels through which trade union intervenes in workplace training; the actual processes and constraints on the involvement of trade unions in skill formation issues. Therefore, qualitative data were employed for complementary aspects of our investigation in order to understand the social processes at play and be more responsive to the needs of policy-makers.¹⁷

The resulting interviews, which ranged from one to two hours, were audio recorded, fully transcribed and analyzed with the software for textual analysis Atlas.ti. A thematic qualitative analysis (Nowell et al., 2017), fit for the purpose of integrating quantitative results (Boyatzis, 1998) and identifying the existing patterns was conducted. Precisely, in a first stage, we used the interview questions to guide our analysis and outline a list of themes that made the analysis more targeted. However, since by using a predetermined thematic framework one loses in flexibility of analysis, and this can bias and limit the interpretation of the results, the list of themes of our qualitative analysis has been partly and inductively integrated in order to return the wealth of data and answer our research questions more in depth. In this phase of open coding, eventually moving to axial coding, new themes, such as trade unions' role in the bilateral funds system, were analyzed in their relation to the other categories. To ensure the reliability and consistency of the interpretative analytic work, the coded themes and their interrelations were discussed among the authors, and a continuous conversation between the emerging categories and theoretical interpretations was maintained. Moreover, we relied on the prolonged engagement (Lincoln and Guba, 1985) – from 2016 to 2018 – of one of the authors of the present contribution in the activity of post-monitoring of workplace training courses financed by bilateral funds within a parallel research project.

¹⁷ In combining quantitative (or variance-based) and qualitative (or case-based) methods, we follow Beach (2019) and avoid the option of using them jointly in order to identify the same causal links. Instead, we use the two methods to answer different questions: quantitative analysis in order to assess the existence of a link, and qualitative analysis to describe the channels underlying those links.

5. Empirical results: quantitative analysis

Table 2 displays the estimation results from the OLS models in (1). They unambiguously suggest two main conclusions. First, we find that the presence of workplace unionism is associated to a higher probability – from 2.7 (share of trained workers) to 5.6 (probability of supplying training) percentage points – that workers undergo workplace training (columns 1 and 2). This also mirrors into higher measures of training quality, as the average training expenditure is also higher, both if computed as per-employee (+16.4%) and per-trainee (+22.5%) cost (columns 3 and 4). Second, the effect of firm-level bargaining is always higher than the mere presence of workplace unionism, with an estimated coefficient of *FLA* that is at least double than the corresponding coefficient for *Union*.¹⁸ This finding is in line with the discussion in section 2: when unions engage in firm-level contracting the positive effects associated to its “collective voice” are more likely to dominate the negative ones typical of its “monopoly face”.

Table 3 displays the results of analogous models estimated via the fixed effect (FE) equation in (2). FE models allow us to control for firm unobserved heterogeneity. However, these models only rely on within-firm variation and are likely to exacerbate the attenuation bias arising from any measurement error in yearly classification of firms by *FLA* and *Union* status. As such, we treat the FE models as complementary, but not necessarily to be preferred, to the OLS evidence presented above. By and large, the main findings are confirmed also in Table 3. Both union presence and firm-level contracting have a positive impact on the quantity and quality of firm-level training. As expected, the estimated coefficients in columns 1-4 remain positive, but in most cases are smaller or not significantly different than in Table 2: e.g., the point estimate of *FLA* on the probability to supply training (share of trained workers) decreases from +10 (+7.2) p.p. to +8.1 (2.7) p.p., while that on per-worker (per-trainee) cost of training from +66.3% (71.8%) to +56.4% (74.4%, but the difference is not significant). This may derive from a combination of attenuation bias and from the effect of firm unobserved heterogeneity, like innovative managerial practices and firm productivity, which are expected to be positively associated

¹⁸ These remarkably high coefficients should not be surprising, given the low average starting values (Table 1).

to workplace union and bargaining activities, on the one hand, and to a company's propensity to train, on the other. Indeed, that there exist a "type" of management that favors workplace training and with which is easier to sign a collective agreement is a view finding support in our qualitative analysis in the next section.

Table 3 further confirms the important finding that it is firm-level contracting, rather than workplace unionism *per se*, that is associated to higher training. Indeed, the higher standard errors of the FE models make all the estimated coefficients of *Union* statistically insignificant. The estimated effect of firm-level bargaining is positive also on the share of workforce undergoing training, but does not survive to a control for firm fixed effects. This apparent puzzle may be explained in terms of *training deepening*: the implication of a firm-level agreement is not that firms train *more workers*, but that they *train more* the workers that would have undergone training anyway.

Columns 5 and 6 offer a first exploration into the issue of whether the training activity is ultimately financed out of a firm's private funds, or rather by resorting to the external financial resources offered by the so-called *fondi interprofessionali*. These are funds bilaterally managed by employers' associations and trade unions. The evidence is mixed. It seems that firm-level bargaining does not have any impact on the training initiatives funded by a firm's own funds (column 5). However, the formal consultation activities leading to the signing of a firm-level contract exert a positive impact on a firm's ability to attract external resources via the *fondi interprofessionali* (the probability is raised by 10 to 12 p.p., see columns 6). The access to such funds to finance workplace training requires an agreement with workers' representatives, something that is more likely to happen within the formal consultation processes leading to the signing a firm-level agreement. More generally, one may argue that the prevalence of collaborative and participative industrial relations, conducive to firm-level agreements, also represents a kind of environmental pre-condition for the decision to apply to, and to successfully obtain, external funds for a firm's training needs. If so, not only does the existence of a firm-level collective agreement ease the access to external funds for training; it also allows the firms to keep internal funds untouched in spite of the higher amount of training provided.

The mere presence of workplace unionism, on the other hand, delivers ambiguous results. According to the OLS estimates, *Union* has a positive effect only on externally

funded training, but the effect is quite small (+1.5 p.p). According to the FE models the same variable is positively associated only to privately funded training initiatives (+6.8 p.p.). However, this effect turns statistically insignificant as soon as, in robustness analyses, we focus on manufacturing firms only. None of the results shown earlier would instead be affected by such a qualification (see Appendix A).

To conclude this section, we point out two caveats. First, despite our effort to account for a large set of control variables, including firm fixed effects, a causal interpretation of our estimates is unwarranted. In Anglo-Saxon settings, the literature has usefully exploited the kind of “natural experiments” offered by close representation elections (DiNardo and Lee, 2004). In this case, firms where the election to establish a union was lost by a few votes, may represent a credible counterfactual scenario for the firms that that could establish a union because the election was won by a small margin. Certification elections, and other natural experiments alike, are unavailable in the institutional settings characterizing most EU countries. Lacking any fully credible exogenous source of variation, our estimates should be most safely interpreted as indicating correlations among the variables of interest. Second, and in common with most of the econometric literature surveyed in section 2, the survey data used in the quantitative analysis offers little useful information to further dig into the many channels and processes at play, as discussed earlier. We believe the qualitative analysis offered in the next section has the potential to offer complementary insights to our quantitative findings, partly responding to the caveats expressed above.

6. Empirical results: qualitative analysis

The qualitative analysis investigates the social processes through which the workplace union (often with support by sector-wide representatives) intervenes on workplace skill formation issues. In spite of some constraints on trade unions’ involvement, it brings to light three different channels: 1) decentralized collective bargaining, 2) the collective voice face, and 3) what we called the *watch-dog function*. Through these channels, workplace union is found to pursue multiple goals (Table 4), part of which finds support in the

literature (e.g. in terms of rent-sharing). Our analysis, however, also calls for an extension of the interpretative hypotheses about union involvement. The achievement of the multiple goals illustrated below is intended to secure trade unions a role in training decisions. In the following, we discuss the results by quoting some of the original and most representative sentences from the interviews.¹⁹

6.1 Constraints on the involvement of trade unions

Our analysis shows that workers' representatives are hardly involved in the decision-making processes leading to the organization of training courses. This is strictly related to the traditional approach towards formation issues that employers, unions representatives, and workers still have. Specifically, we identified three main constraints: employers' taken-for-granted idea that skill formation is a unilateral policy, consistently with the *managerial competence hypothesis* (e.g. FitzRoy and Kraft, 1985; 1987); the understanding of training as a non-priority in the bargaining space by representatives of both the workers and the employers; blue-collar workers' unfavorable approach to training.

The first constraint is the belief of employers' representatives that the issues of workplace skills needs and training are totally unilateral. According to them, indeed, these issues should not be part of negotiations, whether there is support from bilateral funds or not. As employers' representatives told us, skill formation is a traditionally unilateral policy, a company's prerogative:

[TO-1] *"We think that we do not need to discuss with unions on skills needs, search or formation. It's a traditionally unilateral policy: I have a need, I do identify it, make a plan and carry it out [...]. On top of being a company's management's prerogative, things simply work this way: there's an issue of timing [...]. There's never been another partner involved."* (Employers' representative)

[TO-2] *"Companies' duty is caring about resources, human resources in particular. It's a company's prerogative, it's not in the bargaining space. This is in our experience [...]. The generating moment is all on the company's side [...]. The company prepares the technology, the raw materials, the markets, tries to understand and prepare the human resources, and it has always been a*

¹⁹ The original take-outs in Italian are reported in Appendix B.

company's matter [...]. It is in everybody's experience that work organization stays on this side." (Employers' representative)

Workplace skill formation is understood by employers' representatives as a unilateral matter, which has not to be discussed with unions for reasons related to tradition and to pragmatism. The pretended *objective* reasons are that the management knows business strategies; they know training needs; and they are often forced to work in a "crisis" mode, meaning that they have very limited time, which does not allow for collective and shared reflections – especially in SMEs. This is taken for granted: "*Things simply work this way*", "*It is in everybody's experience that work organization stays on this side*".

Second, even if training may well be an issue within collective bargaining, firm-level agreements have other priorities, namely wages and working hours (Hyman, 2001). As a matter of fact, the necessity to fill a skill gap or a shortage of training generally is not a sufficient reason to initiate a firm-level bargaining process. "*I have no idea of agreements exclusively dedicated to training*" told us a workers' representative. Similarly, an employers' representative said: "*I cannot remember of any example. It is not the right channel. Maybe because [training] is not an issue discussed in those circumstances*". This idea is also related to the different timing of collective bargaining and skill formation processes. As an employers' representative said:

[TO-3] "*Training is not really a subject of bargaining. I mean...when we talk of bargaining, we have in mind the one that occurs every three, four years [...]. There are requests, a discussion and an output which is the contract [...]. I mean, [when the necessity to fill a skill gap emerges] there's no time to wait or discuss of this [...]. The day we buy an accounting software, we are already late with training.*" (Employers' representative)

While collective bargaining rounds occur every three or four years, training needs – once recognized – require to be satisfied as soon as possible, especially in SMEs. Indeed, SMEs tend to react to external events at need and do not plan training over the medium/long run; this also happens when the access to bilateral funds is tightly time-constrained. Unions' involvement in workplace skill-formation processes is hence limited by both employers'

and workers' representatives' understanding of training as a non-priority in the bargaining space.

The third constraint on unions' involvement is related to the representation of blue-collar workers. Our analysis points out that, according to both the trade unionists and the human resource managers interviewed, they are hardly able to recognize their skill gaps, as the next excerpts show. To intervene more deeply on training decisions, workers' representatives should be able to provide valuable information on their colleagues' skill needs and on adequate training interventions. Instead, RSU/RSA are themselves workers who often do not possess the capacity to perform a detailed analysis of skill needs:

[TO-4] *“Our general problem – but for a few cases – is that we represent the medium-low level [...]. So, let's say that in order to work on skill formation, we should be able to rely upon members who are able to make an analysis and then a proposal. But if there is no internal debate, like someone who says: «Dear union, I need this, this and this»...Well, it's hard, at least in the manufacture”.* (Union representative)

[TO-5] *“It's hard to think of the Union as of one with an upper-case U, because workplace unionism is made by RSU and RSA. They're wonderful people, but...one is a shift worker, another is a team leader...people who work well, but as far as skill planning is concerned [...] it's a matter of the firm [...]. Skill formation is so specific that it has to be done by those who manage this issue every day”.* (Human resources manager)

On the contrary, white-collar and high-skill workers hold positions closer to the management. Thus, they can better recognize and share their perception of skill gaps with those who are in charge of the company (McGuinness and Ortiz, 2016). In addition, blue-collar workers hardly understand the value and usefulness of training, with the consequence that there is, as union representatives call it, *resistance* from the workers.

[TO-6] *“There's always another side of the story then: resistance from workers, when they say: «My company is asking me to do training, but if afterwards I do not get promoted, why are they making me do it?» [...] There's resistance on the side of the workers.”* (Union representative)

[TO-7] *“They are not uninterested, but less sensitive. The average worker – generally speaking – would like to do always his job without being demoted. [...] Changing one's occupation somehow generates...some disease, and so*

going back to a classroom or gather experience generates – how to say? – a kind of unease, because one feels – in particular workers employed there since many years – to be evaluated again, to start all over again. «Maybe the youngsters should do it, why me?»» (Union representative)

Our interview data show that this experience is also shared by companies. Human resource managers describe the difficulties of involving the lower levels of workers, who conceive training activities as an obligation or as a moment of individual assessment, rather than as an opportunity increasing their human capital. The analysis thus brings to light a cultural constraint related to the union representation target, that is a lack of understanding of the value – also the economic one – that training and human capital have nowadays for the worker, also from an instrumental perspective of employability.

6.2 Unpacking processes: decentralized collective bargaining

Although training is not the priority to bargain over, nor it is the driving force to initiate a workplace agreement, it is also true that firm-level bargaining creates the chance to tackle skill formation issues by providing a *frame* for a wider dialogue. In this collaborative context, the issue of workplace training can more likely arise as a matter of concern between managers and workers' representatives. In the following excerpt, a human resources manager of a large company clearly told us that firm-level bargaining favors the development of a constant dialogue between managers and workers' representatives within which even the themes of skill formation, although not primary, can be shared:

[TO-8] *“In my experience, even for companies that use workplace agreements as innovative tools, to go beyond national agreements, the issue of reducing skill mismatch is not a priority in the [industrial] relations agenda. This issue alone is not sufficient to sign or update a workplace agreement. Workplace agreements are still based on work organization and – in our case – also on some innovative tools like welfare provisions; somehow they favor, they give rise to, create the context [...] for the company to organize those training courses I was talking about”.* (Human resources manager)

According to the data, the mechanism is the following: at the beginning, there are complex claims with various themes and very long discussions with the consequence that the top issues (wages and working hours) are the most debated and other topics, including

training, are overlooked. This is especially true if it is the first agreement between the partners involved. If the agreement is renewed, then it may be that, in addition to wages and work organization, the agreement tackles the theme of workplace training: *“It is the willingness to bargain over a comprehensive agreement that brings the discussion on training”*. As a union representative explained:

[TO-9] *“We make also complex and comprehensive agreements, and indeed discussions last quite a lot [...]. Generally speaking, it is the willingness to bargain over a comprehensive agreement that brings the discussion on training. Training is not the leading reason. Usually, what brings a company to firm-level bargaining [...] is either the time-schedules or performance pay. All the remaining issues follow. When agreements are extended or renewed, then one is also able to go into details. Because if our system of performance pay works, if our agreement on time-schedules works and the company does not have any particular need, then we can focus on the other issues in the next bargaining round.”* (Union representative)

Importantly, respondents understand collective bargaining as a process of negotiation, which involves trade-offs for both sides. Our data analysis shows that, when the chance to include training issues in the firm-level agreement is created, the union's main goal is twofold: to negotiate *ex-ante* a fair distribution between workers and the company of the returns obtained from investment in training on the one side, and to demand greater participation in firm's decision-making processes regarding skill formation on the other side. Therefore, when the agreement is renewed, and the platform includes other topics beyond the priority ones, the stakes for the unions are some economic components of rent-sharing, such as salary increases and bonuses, and a greater union involvement in decision-making processes, for example in the form of periodic meetings and information exchanges through which *“share the path”*:

[TO-10] *“In the platform we ask for training and for appreciation of workers’ multi-tasking and polyvalence, relating them also to wage increases, because we believe that when a worker holds higher skills, this should be recognized also from a pay standpoint [...]. This is the challenge. We often say that our idea is: «Is the worker more qualified? Yes? Well, then s/he should hold a higher job qualification and should be paid more». This should be the rule. There are companies, large ones, where we went through a detailed analysis, and then they invested and recognized job qualifications to reward professionalism and skills [through] wages [...]. Therefore, whenever we are*

able to share the path, it's already a non-negligible step towards participation". (Union representative)

The economic components of rent-sharing which our respondents refer to are the payment of wage bonuses related to training courses, and are regulated by firm-level agreements. Sometimes, the agreements may also contain wage claims that refrain from opportunistic behaviors (the *hold-up* problem: Card *et al.*, 2014; Devicienti *et al.*, 2017; Green and Heywood, 2011) and the appearance of the *monopoly face* discussed above. Bargaining can, for instance, set up skill-mapping systems and parameters for the recognition of greater remuneration for the attained professionalism (Adapt, 2015; CNEL-Istat, 2015; Ocsel, 2015). By way of example, we show the following excerpts from two interviews with the human resource managers of large companies presenting best practices in terms of training policy and industrial relations. If in the first excerpt, the interviewee recounts his experience of having linked the productivity bonuses to the successful attendance of employees at training courses, in the second extract the interviewee tells us how in his company the trade union has been involved in the setting up of the tailor-made job description linked to salary increments, as recognized in the writing of a complex second level collective agreement in the 1990s, then updated over the years.

[TO-11] *"We need to be competitive and training is a way to be competitive [...]. We sometimes put it in firm agreements on productivity bonuses, thus workers also have an economic advantage [...]. In the last few years we have linked the bonus of some departments to the training hours". (Human resources manager)*

[TO-12] *"Union has that document and it is called (Tfor) Technical force. It is a picture of the necessary professional roles to correctly cover the productive roles [...]. The union is informed of every step of each worker within this training system [...]. The company and the union [...] set up an organizational chart [...]. In our firm we have decided to do something different: we take a picture of the company, define what the company needs, we agree on what the numbers are, then we go on to define what these numbers of people should be like, such as professional content they must have, what training courses they must attend, and at the end of the course what salary-level they will have". (Human resources manager)*

As stated in the last quotation, bargaining can in some cases include the involvement of the union in all phases of skill formation in the company. When the conditions for

advanced bargaining are present, as a union representative says in the following excerpt, trade union can obtain different degrees of participation in firm's decision-making processes (Bryson, 2018). This ranges from the introduction of information and consultation procedures, to the setting up of a system for monitoring training courses, and the creation of bilateral bodies with specific functions in the field of professional development (Adapt, 2015; CISL, 2015; CNEL-Istat, 2015).

[TO-13] *“Generally speaking, what can collective bargaining do? It can envisage participation paths, and [...] can envisage a little or a lot [...]. It can foresee training courses to analyze the production processes cross-sectionally, and then study the workers' skill needs and then, say, entrust the internal skill formation bodies; it can make provision for a monitoring role for trade unions. However, we're always talking about very advanced bargaining processes and industrial relations”.* (Union representative)

Finally, our analysis highlights the pivotal role played by the union in the processes of skill formation when bargaining is *defensive*, that is after a firm's closing or a corporate restructuring (Klindt, 2017; Pulignano and Stewart, 2013). According to our data, especially in the last years after the economic recession, trade unions - by relying on their knowledge of the local labor market and their bargaining capacity - have pursued the goal of employment protection through the promotion of employees' training, as we read in the following excerpt:

[TO-14] *“And we signed agreements aimed at insisting that companies support redeployment also through retraining, also in order to manage the employment protection issue. Then, as unions, we did not enter into the contents of training, this is all up to the companies. What we said is: «You, company, make an effort, if you want to manage this process we are going through, to retrain the workers, in order to manage the employment issues at best»”.* (Union representative)

Specifically, unions - which according to interview data became in this case much more involved in human capital issues - can provide an internal intervention, that is re-training for some employees in case of company restructuring, and an external one, that is outplacement agreements for redundant workers who undertake training courses. As explained by a union representative in the next extract, in case of company restructuring and *defensive* agreements, unions always promote the re-training of those employees who

may lack sufficient skills, so as to protect their employment. In case of an outplacement agreement, unions negotiate a financing by the company to retrain the dismissed workers. In the last case, the role of active labor policies and regional funds are fundamental.

[TO-15] *“Within restructuring processes, we can conduct an analysis with the management and discuss with them, in order to understand where the company is going. Put it simply: if the company today produces phones, and tomorrow is going to produce boilers, obviously we need to radically change the skills [...]. So we generally do this and can ask: «Which skills do you need? Do you have them all within the plant?» – we use this argument also to limit the layoffs – [...] «If not, are you available» – we try it immediately – «are you available to start (re-)qualification processes for your employees without those skills?» [...] The second issue is [as follows]: we know that some workers will be laid off, and we can expect [...] outplacement agreements, [...] where an issue is agreeing that the company will invest 1,000, 5,000, 10,000 Euros, or whatever the sum, on each worker in order to fund retraining paths also through outplacement [...]. Then we can also make agreements involving other institutions, the Regional Government in particular, that holds most of the funds for active policies”.* (Union representative)

In short, the data show that through collective bargaining the trade union pursues (at least) three goals: to negotiate *ex-ante* rent-sharing, to demand greater workers’ involvement on skill formation, and to protect the employment.

6.3 Unpacking processes: collective voice face

The respondents lucidly told us that industrial relations are constantly exercised, inside and outside the company, on a number of issues that exceed the contents written on “advanced” and defensive collective agreements. Unions’ collective voice function indeed can be performed both intra-organization and inter-organizations that is, as an employers’ representative told in the next quote, through both the daily relations between managers and workers’ representatives within the firm, and the setting up of a regional information system regarding skills needs and the necessary training interventions, which involves different stakeholders (Trampusch and Eichenberger, 2012):

[TO-16] Interviewee: *“The wisdom to say: «We need [skill formation] because trained workers are more secure workers» they [the unions] have it, but they*

don't bring it to the bargaining table with the firm because it's not the right place".

Interviewer: *"And which is the right one?"*

Interviewee: *"Well, industrial relations are always going on, they do not exist only during the bargaining process, so there are moments to discuss. Then every single sector-level agreement includes an information system: through recurring meetings, and so on".* (Employers' representative)

Our analysis reveals that having repeated meetings and opportunities for sitting at a negotiating table, although to subscribe contents other than training, can set in motion a series of conditions, such as information exchanges, collaborative company climate, dialogue between the social partners inside and outside the company, long-term commitment, which favor the investment in human capital. Specifically, data show that unions collective voice function facilitates the recognition of skill gaps and mismatches by workplace unions, the firm's access to external financial resources by *Fondi interprofessionali*, and potentially increases union's power to contribute to the definition of training contents within the call system of bilateral funds.

According to our data about large companies, where human resources management practices are more developed, industrial relations more advanced, and best practices in terms of training policy emerge, workers' representatives can contribute to the recognition of skill gaps and mismatches, as well as in terms of proposals of training activities. As a human resources manager told us:

[TO-17] *"Every single month I plan a meeting with workers' representatives, I do not wait for a problem to come out, we do not meet when the unions convene me [...]. Hence, everyone has to be involved, and [together] we discuss whether there are problems we did not perceive and whether the workers talked to the unions [...]. During the meetings, [workers' representatives] can give us some advice: [maybe] there's a problem with a union member and they deem we did not do enough, since s/he has not a good performance for instance, and say: «Provide her with some extra training, which is the best way to overcome problems positively». They also can take part into such proposals [...]. So, about skill formation: if they detected some gap we overlooked, they tell us".* (Human resources manager)

As we read, in order for this to happen, there must be a collaborative climate and a constant dialogue between managers and workers' representatives beyond the formal

bargaining meetings, which, we could say, represent a kind of precondition. Moreover, taking also into account the results of our econometric analyses, we argue that good-quality industrial relations at the company level – also signaled through the presence of firm-level bargaining – favor the application for external training funds, especially bilateral funds (*fondi interprofessionali*). They indeed require the involvement of workers' representatives as far as the company's training project needs to be shared and approved by the RSU/RSA, as shown for example by the next excerpts:

[TO-18] “*About human capital formation...yes: there can be a discussion [with the union] and often there's one. There are some peer bodies, like Fondimpresa – which is a fund – that necessarily requires discussion, participation and co-determination of training processes [with the union]*”. (Employers representative)

[TO-19] “*You know, these ‘fondi interprofessionali’ are valued more if we also sign the agreements, so we sign many training agreements with the firms because there's an evaluation mechanism that envisages [...] the union's signature, which means that there's an agreed skill formation process. So it often happens...*”. (Union representative)

Respondents refer here to *Fondimpresa*, the largest bilateral fund – mainly for manufacturing companies, but not only – which is constituted by the Italian employers' federation (Confindustria) and the three largest trade unions (Cgil, Cisl, Uil). Similarly to the other twenty-one currently existing funds for continuing vocational training in Italy, it funds training courses for workers employed in companies enrolled into the fund itself. However, it is not subject to firm collective agreements as it follows times and modes different from those of the bargaining process, as explained in the following quote by an employers' representative:

[TO-20] “*While firm-level bargaining is a sine wave, more or less it occurs every three years, then waits and starts again...Well, training is a straight line, it may occur at any time during the company's life [...]. The bargaining dynamics consists of someone who makes a proposal, and somebody else who counteroffers or accepts [...]; then [in skill formation through Fondimpresa] the person in charge of evaluating the training proposal is the internal workers' representative, who is directly voted by the employees, while with collective bargaining, in nine out of ten cases – if not in 9.5 out of ten – there's always*

the external assistance of unions. It's not a bargaining process as we usually mean it." (Employers representative)

Training financed under bilateral funds is not properly part of firm-level bargaining, but can flourish more smoothly in organizations where there are constant trade union relations. As a matter of fact, despite interview data suggest that RSU/RSA generally become aware of the training courses only at the last moment, leaving little room for discussion and negotiation, a collaborative climate between the social partners allows for timeliness, a crucial quality to take part into competitive calls (the so-called *Avvisi*) that bilateral funds open with tight deadlines on a variety of issues, such as competitiveness, technological innovation of product and/or process, and internationalization.

Furthermore, whereas the RSU/RSA have a limited control over how bilateral funds work, they keep regularly in touch with external union representatives. Together with other stakeholders, external union representatives play an important role upstream in the decision process: taking advantage of the meetings related to the call system that bilateral funds use for training financing, they potentially accrue some power to contribute to the definition of training and calls' contents. As an expert on skill mismatch and training told us: "*Confindustria* [the main employers' representation body in the manufacturing sector] *and the unions keep a smooth relationship, and meet here every day: all projects under bilateral funds about continuing vocational training are discussed*". Despite data suggest that this path is only at the beginning, a new role here may propel unions to coordinate within multi-stakeholder networks crucial activities aimed at the skill development for the local labor market (Del Punta, 2003; Kristensen and Rocha, 2012).

6.4 Unpacking processes: watchdog function

As far as firm-specific skill formation is concerned, bilateral funds provide the unions with the possibility to exercise new roles, which we enclose in the term *watchdog*. The watchdog function includes trade union's monitoring activities on the training programs carried out in a company, the sowing of the employability culture – also at the cost to give up to some direct (economic) recognition – and the promotion of wider workers' inclusion.

Specifically, in providing the post-training function of monitoring, unions check that courses have been actually delivered, that attendees are satisfied, and to which extent

they have understood the relevance of continuing vocational training for their employability. In other words, they try, not without difficulties, to tackle the (blue-collar) workers' resistance we mentioned above, and to promote instead an employability culture:

[TO-21] *"We seldom intervene on training contents, as skills are very technical and company-specific, [...] therefore I just care about checking that training is given the right relevance and that it's not happening the opposite [...]. We would like to reinforce the attitude for skill formation, but if participants' experiences are negative, then the opposite happens, and workers just say: «No way, I tried once and it was a total mess, I only lost time and I got bored»."* (Union representative)

[TO-22] *"In other words, it means that training courses that are not aimed at a higher pay, then [they are hardly welcome]...On the contrary you may say: «Yes, that's also an objective, but another one is to give you skills that are useful to retain your current job». But this is not an easy message."* (Union representative)

In the respondents' view, training is strictly related to the issue of employability, which is seen as crucial as never before both by the entrepreneurs – because it contributes to organizational flexibility – and by the unions, as a more trained and functionally flexible worker is easier to employ and then to protect. The next extract from an interview with an employers' representative is particularly clear:

[TO-23] *"These long-lasting crisis years prove that functional flexibility is a value added. And the most skilled workers are also the easiest to protect. Or the most employable. In this perspective, the most advanced unions and companies do totally agree. The union, because has a worker who is stronger on the labor market; the company, because has a worker who is more supportive to organization flexibility".* (Employers representative)

Trade unions seem to care not only about employability, but also about the inclusion of some segments of the workforce – especially those with low qualifications – and about the introduction of training topics beyond those required by the law. In cases where smooth trade union relations create a collaborative company climate and training plans are shared with workers' representatives, as shown by the next excerpts, RSU/RSA can take the chance to widen the audience of recipients towards the inclusion of blue-collars and low-

skilled workers (Hoque and Bacon, 2008; Lindsay *et al.*, 2012; Wiß, 2017). Moreover, training contents go beyond the compulsory and basic courses.

[TO-24] “...but we should say that companies are more prone to make this kind of skills formation on the high levels, and not on blue-collar workers. For the blue-collars, they propose the compulsory courses, i.e. those on safety; while on the high levels it’s an issue they’d like to manage on their own, they do not like to talk about. That’s indeed the point: what we usually say on skills formation is: «If this time training is devoted to managers, next time it will be the other ones’ turn» [...]. Companies bet on those ones. And the discussion is: «Let’s try to involve everyone, to prepare something that may be of interest to the ones we do represent the most».” (Union representative)

[TO-25] “Sometimes, once a year, we get to a discussion in which the company, based on their own analyses, says: «We’d like to do this kind of training...» And the union – the RSU/RSA – in turn based on its own data: «No, in our view, on top of what you say, there’s also need to start courses of this type in that department» and so on. This is to prevent that everything boils down to a course about Word or Excel or English language, that are not really useful [...]. If this path, the plans and the explanation to the workers about where training will intervene are shared, then it’s a good starting point”. (Union representative)

During the periodic meetings between the RSU/RSA and company’s human resource managers, union representatives perform the function of watchdog to the extent that they claim for an inclusive logic, showing the way to be able to take part into the processes of skill accumulation.

7. Interpretation and concluding remarks

The literature studying the relationship between firm-level union activity, decentralized collective agreements and workplace training highlights the existence of many possible underlying channels. Some of them are expected to entail a mainly negative association among the variables of interest, while others are presumed to have more positive impacts. The sign of the overall effect cannot be established by theory alone, which also prevents informed policy indications to be provided. A major interest in this respect lies in assessing

whether the indications given by many commentators and international institutions towards the promotion of more decentralized industrial relations have any sound empirical basis.

To tackle this issue, we begun by using econometric evidence drawn from a representative firm-level survey. Our quantitative analysis provides robust evidence that a positive association between workplace training, and union activity at the firm level actually exists and that – other things being equal – its sign is positive. This is especially true when union activity at the workplace is channeled through the processes leading to decentralized bargaining and resulting in the signing-up of a formal firm-level agreement. The positive effects are found when either measures of training quantity and training quality are used, and when the estimation methods account for firm unobserved heterogeneity via fixed effect models. Hence, the quantitative analysis allows us to discard the empirical relevance of the hold-up theory, as far as investments in firm-specific *human* capital are concerned. This result echoes the ones in Card et al. (2014) who do not report any evidence of hold-up in the case of *physical* capital accumulation for firms operating in the Veneto region of Italy. An interpretation of these findings is that the positive effects broadly consistent with the “collective voice” face of unionism tend to dominate the more adverse ones arising from its “monopoly face”.

We have also argued that the quantitative analysis alone, even with relatively rich firm-level surveys like the one we have used, is not sufficient to make any further progress in disentangling among the various channels and processes at play. Using a mixed-method approach, where quantitative and qualitative methods are used jointly, appears as a more promising avenue of investigation. Hence, we proceeded with a series of semi-structured interviews to the key informants that are regularly engaged in firms’ training initiatives and industrial relations. The results of this qualitative exercise is a mix of pessimistic and more optimistic views on the actual relationship between workplace unionism and training.

On the more pessimistic side, respondents pointed out that workers’ representative and unions do not typically have a direct role in the initiation of a firm’s training activities. To being with, workplace unions are not interested – at least at first – in bargaining over training. Their shorter-term interest lies in wages and other working conditions. Second, the respondents indicated that worker’s representative, and even the supporting officials of local unions, do not typically have the skills and competences to identify a firm’s skill

needs and to suggest proper training initiatives. Third, a prevalent cultural trait shared among the social partners is that training is essentially a firm's prerogative of the firm and of its managers. According to this account, one should not expect that further decentralization of industrial relations can significantly contribute to raise a country's accumulation of firm-specific skills.

Despite these rather negative views, many respondents provided elements that lend themselves to a number of more optimistic interpretations, at least in a dynamic perspective. First, respondents indicated that in successive rounds of collective bargaining, it is more likely that training enters the "bargaining space", a dynamic process akin to a "maturation effect" of collective bargaining, hitherto understated by the literature. Second, successive rounds of collective bargaining contribute to creating the type of collaborative corporate environment that often constitutes a pre-condition for investment, including those in human capital. Relatedly, a collaborative working environment is also conducive to the successful attraction of external financial resources from specialized bilateral funds. Third, respondents called attention to the watchdog function of workplace unions, not only in terms of an effective monitoring of the training plans, but also with reference to a broader inclusiveness of the various segments of a firm's workforce.

Undoubtedly, these more favorable views regarding the relation between workplace unionism, collective bargaining and training are likely to refer to firms and contexts already characterized by frontier (or "best") practices in advanced industrial relations and training initiatives. Also, many of the processes involved are dynamic in nature, take time, and often require cultural changes among the main actors involved, unions and management alike. Nevertheless, if XXI century's unions are to become the "collective intelligence" of workers, able to guide them in the evaluation of the new industrial plans and of the trustworthiness of whom they proposes, it is important that such cultural changes are promptly activated. The same holds on the employers' side.

In turn, this calls for proper policy actions. These policies should not just aim at promoting more decentralization of collective bargaining; it is just as important that they promote higher-quality decentralized industrial relations. Even if training will not be initially part of the bargaining platform, more training will follow over time with the growing of the bargaining space and the accumulation of bargaining skills and information.

In this view, tax breaks for wage premiums bargained at the territorial- or firm-level – the real triggers of firm-level bargaining – should be extended, made less dependent to the contingent fiscal budget constraints, less vulnerable to political uncertainties, and more specifically linked to the successfully monitored training initiatives.

Higher quality decentralization is also sometimes equated to “organized decentralization”, i.e. a process where sectoral (first-level) and decentralized (second-level) bargaining coexist, with specialized functions at the distinct levels. The optimal specialization of the two levels should counterbalance the need to provide basic levels of training to workers in the same sector, something that is more effectively done at the first-level, with firm-specific training needs within the sector, to be achieved at the second level. Organized decentralization should also internalize the specific needs of small and medium enterprises, which are often unable to engage in workplace unionism and bargaining, on the one hand, and to set firm-level training initiatives. Here too there is large scope for proper policies, aimed at promoting firm’s networking in training initiatives and territorial, rather than firm-level, bargaining.

References

- Acemoglu, D. and Pischke, J.S. (1999), "Beyond Becker: training in imperfect labor markets", *Economic Journal*, 109(453): 112-142
- Adapt (2015), "La contrattazione collettiva in Italia 2012-2014", Modena: Adapt University Press
- Addison, J.T., Bellmann, L. and Kölling, A. (2004), "Unions, works councils and plant closings in Germany", *British Journal of Industrial Relations*, 42(1): 125-148
- Allaart, P., Bellmann, L. and Leber, U. (2009), "Company-provided further training in Germany and the Netherlands", *Empirical Research in Vocational Education and Training*, 1(2): 103-121
- Beach, D. (2019), "Multi-method research in the social sciences: a review of recent frameworks and a way forward", *Government and Opposition*, forthcoming
- Bellmann, L., Gerner, H-D. and Upward, R. (2018), "Job and worker turnover in German establishments", *The Manchester School*, 86(4): 417-445
- Boockmann, B. and Steffes, S. (2010), "Workers, firms or institutions: what determines job duration for male employees in Germany?", *Industrial and Labor Relations Review*, 64(1): 109-127
- Booth, A., Francesconi, M. and Zoega, G. (2003), "Unions, work-related training and wages: evidence for British Men", *Industrial and Labor Relations Review*, 57(1): 68-91
- Boyatzis, R. (1998), "Transforming qualitative information: Thematic analysis and code development", Thousand Oaks, CA: Sage
- Breda, T. (2015), "Firms' rents, workers' bargaining power and the union wage premia in France", *The Economic Journal*, 125: 1616-1652
- Brown, M. and Heywood, J.S. (2006), "Investigating the cause of death: industrial relations and plant closures in Australia", *Industrial and Labor Relations Review*, 59(4): 593-612
- Bryson, A.J. (2018), "Mutual gains? The role for employee engagement in the modern workplace", in G. Bosio, T. Minola, F. Origo and S. Tomalleri (eds.) "Rethinking entrepreneurial human capital", Berlin: Springer

- Busemayer, M. and Trampusch, C. (2012, eds.), “The political economy of collective skill formation”, Oxford: Oxford University Press
- Card, D., Devicienti, F. and Maida, A. (2014), “Rent sharing, hold-up and wages: evidence from matched panel data”, *Review of Economic Studies*, 81(1): 84-111
- Cardullo, G., Conti, M. and Sulis, G. (2015), “Sunk capital, unions and the hold-up problem: theory and evidence from cross-country sectoral data”, *European Economic Review*, 76: 253-274
- Cavanaugh, J. (1998), “Asset-specific investment and unionized labor”, *Industrial Relations*, 37(1): 35-50
- Cedefop (2019a), “Continuing vocational training in EU enterprises: developments and challenges ahead”, Cedefop Research Paper no. 73, Luxembourg: Publication Office of the European Union
- Cedefop (2019b), “The changing nature and role of vocational education and training in Europe. Volume 7: VET from a lifelong learning perspective: continuing VET concepts, providers and participants in Europe 1995-2015”, Cedefop Research Paper no. 74, Luxembourg: Publication Office of the European Union
- Cella, G.P. and Treu, T. (2009), “Relazioni industriali e contrattazione collettiva”, Bologna: Il Mulino
- Cerruti, G. (2011), “L’evoluzione della contrattazione aziendale in provincia di Torino tra 1993 e il 2007”, *Quaderni di Rassegna Sindacale*, 2: 259-302
- CISL (2015), “Rapporto OCSEL sulla contrattazione decentrata di secondo livello negli anni 2013-2014”, Rome: CISL. Available at: <https://www.cisl.it/attachments/article/740/Rapporto%20OCSEL%20%202015.pdf>
- CNEL (2007), “Lineamenti della contrattazione aziendale nel periodo 1998-2006”, Rome: CNEL. Available at: http://adapt.it/adapt-indice-a-z/wp-content/uploads/2013/08/cnel_2007.pdf
- CNEL-ISTAT (2015), “Produttività, struttura e performance delle imprese esportatrici, mercato del lavoro e contrattazione integrativa”. Available at: https://www.istat.it/it/files/2016/03/Report_Cnel_Istat1.pdf

- Cooney, R. and Stuart, M. (2012, eds.), *Trade Unions and Workplace Training: Issues and International Perspectives*, New York: Routledge.
- D'Amuri, F. and Giorgiantonio, C. (2015), "Stato dell'arte e prospettive della contrattazione aziendale in Italia", *Diritto delle Relazioni Industriali*, 25(2): 297-341
- Damiani, M. and Ricci, A. (2014), "Decentralized bargaining and performance-related pay: evidence from a panel of Italian firms", *International Journal of Manpower*, 35(7): 1038-1058
- Del Punta, R. (2003), "Enti bilaterali e modelli di regolazione sindacale", *Lavoro e diritto*, 2: 219-222
- Devicienti, F., Manello, A. and Vannoni, D. (2017), "Technical efficiency, unions and decentralized labor contracts", *European Journal of Operational Research*, 260(3): 1129-1141
- Diamond, P. (1982a), "Aggregate demand management in search equilibrium", *Journal of Political Economy*, 90(5): 881-894
- Diamond, P. (1982b), "Wage determination and efficiency in search equilibrium", *Review of Economic Studies*, 49(2): 217-227
- DiNardo, John, and David S. Lee (2004) "Economic impacts of new unionization on private sector employers: 1984–2001", *Quarterly Journal of Economics*, 119(4): 1383–1441
- Dostie, B. (2018), "The impact of training on innovation", *ILR review*, 71(1): 64-87.
- Draghi, M. and Trichet, J.C. (2011), "Letter to the Prime Minister of Italy", http://www.corriere.it/economia/11_settembre_29/trichet_draghi_inglese_304a5f1e-ea59-11e0-ae06-4da866778017.shtml
- Estevez-Abe, M. Iversen, T. and Soskice, P. (2001), "Social protection and the formation of skills: a reinterpretation of the welfare state", in P. Hall and P. Soskice (eds.) "Varieties of capitalisms. The institutional foundations of comparative advantage", Oxford: Oxford University Press
- Eurofound and Cedefop (2009), "Contribution of collective bargaining to Continuing Vocational Training" available on:

- <https://www.eurofound.europa.eu/publications/report/2009/industrial-relations/contribution-of-collective-bargaining-to-continuing-vocational-training>
- European Commission (2008), “New skills for new jobs”, COM(2008) 868
- European Commission (2010), “An agenda for new skills and new jobs: a European contribution to full employment”, COM(2010) 682
- European Commission (2016), “A new skills agenda for Europe. Working together to strengthen human capital, employability and competitiveness”, COM(2016) 381
- FitzRoy, F.R. and Kraft, K. (1985), “Unionization, wages and efficiency”, *Kyklos*, 38: 537-554
- FitzRoy, F.R. and Kraft, K. (1987), “Efficiency and internal organization: works councils in West German firms”, *Economica*, 54: 493-504
- Freeman, R.B. and Lazear, E.P. (1995), “An economic analysis of works councils”, in J. Rogers and W. Streeck (eds.) “Works councils: consultation, representation and cooperation in industrial relations”, Chicago: University of Chicago Press
- Freeman, R.B. and Medoff, J.L. (1979), “The two faces of unionism”, *Public Interest*, 57: 69-93
- Freeman, R.B. and Medoff, J.L. (1984), “What do unions do?”, New York: Basic Books
- Green, C.P. and Heywood, J.S. (2011), “Flexible contracts and subjective well-being”, *Economic Inquiry*, 49(3): 716-729
- Green, F. (1993), “The impact of trade union membership on training in Britain”, *Applied Economics*, 25: 1033-1043
- Green, F., Machin, S. and Wilkinson, D. (1999), “Trade unions and training. Practices in British workplaces”, *Industrial and Labor Relations Review*, 52: 179-195
- Grout, P.A. (1984), “Investment and wages in the absence of binding contracts: a Nash-bargaining approach”, *Econometrica*, 52(2): 449-460
- Harcourt, M. and Wood, G. (2007), “The importance of employment protection for skill development in coordinated market economies”, *European Journal of Industrial Relations*, 13(2): 141-159
- Hashimoto, M. (1981), “Firm-specific capital as a shared investment”, *American Economic Review*, 71(3): 475-482

- Heyes, J. and Stuart, M. (1998), “Bargaining for Skills: Trade Unions and Training at the Workplace”, *British Journal of Industrial Relations*, 36 (3): 459-467.
- Hirsch, B. (1991), “Labor unions and the economic performance of firms”, Kalamazoo: W.E. Upjohn Institute for Employment Research
- Hirsch, B., Schnabel, T. and Schnabel, C. (2010), “Works councils and separations: voice, monopoly and insurance effects”, *Industrial Relations*, 49(4): 566-592
- Hoque, K. and Bacon, N. (2008), “Trade Unions, Union Learning Representatives and Employer-Provided Training in Britain”, *British Journal of Industrial Relations*, 46 (4): 702-731.
- Hyman, R. (2001), *Understanding European Trade Unionism: Between Market, Class & Society*, London, Sage.
- Johnson, R. B., Onwuegbuzie, A. J., and Turner, L. A. (2007), “Toward a definition of mixed methods research”, *Journal of Mixed Methods Research*, 1(2): 112–133
- Katz, E. and Ziderman, A. (1990), “Investment in general training: the role of information and labor mobility”, *The Economic Journal*, 100(403): 1147-1158
- Klindt, M. P. (2017), “Trade union renewal through local partnerships for skill formation”, *Transfer*, 23(4): 441-455
- Kriechel, B., Muehlemann, S., Pfeifer, H. and Schütte, M. (2014), “Works councils, collective bargaining, and apprenticeship training – Evidence from German Firms”, *Industrial Relations*, 53(2): 199-222
- Kristensen, P. H. and Rocha, R. S. (2012), “New roles for the trade unions: five lines of action for carving out a new governance regime”, *Politics & Society*, 40(3): 453-479
- Lazear, E.P. (2009), “Firm-specific human capital: a skill-weight approach”, *Journal of Political Economy*, 117(5): 914-940
- Leuven, E. (2005), “The economics of private sector training: a survey of the literature”, *Journal of Economic Surveys*, 19: 91-111
- Lincoln, Y. and Guba, E. G. (1985), *Naturalistic Inquiry*, Newbury Park, CA, Sage.
- Lindsay, C., Canduela, J. and Raeside, R. (2012), “Polarization in access to work-related training in Great Britain”, *Economic and Industrial Democracy*, 34(2): 2015-225

- Manning, A. (2006), “A generalized model of monopsony”, *The Economic Journal*, 116(508): 84-100
- McGuinness, S. and Ortiz, L. (2016), “Skill gaps in the workplace: measurement, determinants and impacts”, *Industrial Relations Journal*, 47(3): 253-278
- Mortensen, D. (1970), “A theory of wage and employment dynamics”, in E. Phelps (ed.) “Microeconomic foundations of employment and inflation theory”, London: Macmillan
- Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J. (2017), “Thematic Analysis: Striving to Meet the Trustworthiness Criteria”, *International Journal of Qualitative Methods*, 16: 1-13
- OECD (2015), “Employment Outlook”, Paris: OECD
- Oswald, A.J. (1985), “The economic theory of trade unions: an introductory survey”, *Scandinavian Journal of Economics*, 87: 160-193
- Parent, D. (2004), “Incentives? The effect of profit sharing plans offered by previous employers on current wages”, *Economics Letters*, 83: 37-42
- Pfeifer, C. (2011), “Works councils, union bargaining and quits in German firms”, *Economic and Industrial Democracy*, 32(2): 243-260
- Pissarides, C. (1985), “Short-run equilibrium dynamics of unemployment, vacancies and real wages”, *American Economic Review*, 75(4): 676-690
- Pulignano, V. and Stewart, P. (2013), “Firm-level restructuring and unions strategies in Europe: local union responses in Ireland, Italy and the Netherlands”, *Work, Employment and society*, 27(5): 842-859
- Quintini, G. (2014), “Skills at work: how skills and their use matter in the labour market”, OECD Social, Employment and Migration Working Papers no. 158
- Rogers, J. and Streeck, W. (1995), “Works councils”, Chicago: University of Chicago Press
- Sacchi, S. (2015), “Conditionality by other means: EU involvement in Italy’s structural reforms in the sovereign debt crisis”, *Comparative European Politics*, 13(1): 77-92
- Stegmaier, J. (2012), “Effects of works councils on firm-provided further training in Germany”, *British Journal of Industrial Relations*, 50(4): 667-689

Trampusch, C. and Eichenberger, P. (2012), “Skills and industrial relations in coordinated market economies – Continuing vocational training in Denmark, the Netherlands, Austria and Switzerland”, *British Journal of Industrial Relations*, 50(4): 644-666

Tüselmann, H.-J., McDonald, F., Heise, A., Allen, M. M. C. and Voronkova, S. (2007), “Employee Relations in Foreign-Owned Subsidiaries”, New York: Palgrave Macmillan

Wiß, T. (2017), “Employee representatives’ influence on continuing vocational training: The impact of institutional context”, *European Journal of Industrial Relations*, 23(2): 169-185

Tables and Figures

Table 1. Descriptive statistics

	# <i>Obs.</i>	2010		# <i>Obs.</i>	2015	
		<i>Mean</i>	<i>St. Dev.</i>		<i>Mean</i>	<i>St. Dev.</i>
Share with DCB	4,745	0.096	0.30	4,524	0.100	0.30
Share with Unions	4,745	0.201	0.400	4,524	0.191	0.390
Share with any training	4,745	0.440	0.50	4,524	0.58	0.49
No. of trainees	4,746	10.67	54.96	4,511	16.01	87.15
Share of trainees	4,756	0.23	0.34	4,524	0.39	0.42
Total cost	4,423	4531.5	30903.2	3,759	6258.4	47308.8
Per-employee cost	4,431	98.5	452.7	3,760	123.3	556.4
Per-trainee cost	4,430	340.2	2281.2	3,759	308.7	1908.0
Share using internal funds	4,746	0.31	0.46	4,524	0.40	0.49

Source: own computations on RIL data. Notes: costs are at constant prices in Euros.

Table 2. Estimation results. Pooled OLS estimates.

	<i>Training (0/1)</i>	<i>% worker on training</i>	<i>Cost training per worker</i>	<i>Cost training per trainee</i>	<i>Firm's funded training (0/1)</i>	<i>Use of bilateral funds (0/1)</i>
Second-level bargaining	0.100*** [0.016]	0.072*** [0.015]	0.663*** [0.099]	0.718*** [0.115]	-0.024 [0.019]	0.119*** [0.015]
Union presence	0.056*** [0.015]	0.027** [0.012]	0.164** [0.079]	0.225** [0.093]	0.017 [0.015]	0.015* [0.009]
No of Obs.	7797	7797	7066	7066	7790	7784
Adj. R2	0.159	0.109	0.169	0.166	0.041	0.183

Source: own computations on RIL data. Notes: *** = 1% significant; ** = 5% significant; * = 10% significant. Robust standard errors in second lines. Controls include a time-trend, managers' educational level, type of ownership (family-based or not), workforce composition by gender, age class, education, occupation (white and blue collars) and type of contract (permanent or temporary), value added per employee, presence in foreign markets, firm's age and size, sector and macro-region.

Table 3. Estimation results. Fixed-effect estimates

	<i>Training (0/1)</i>	<i>% worker on training</i>	<i>Cost training per worker</i>	<i>Cost training per trainee</i>	<i>Firm's funded training (0/1)</i>	<i>Use of bilateral funds (0/1)</i>
Second-level bargaining	0.081*** [0.030]	0.027 [0.028]	0.564*** [0.195]	0.744*** [0.233]	-0.018 [0.037]	0.104*** [0.029]
Union presence	0.044 [0.032]	0.028 [0.026]	-0.016 [0.180]	0.108 [0.210]	0.068** [0.032]	-0.015 [0.022]
No. of Obs.	7797	7797	7066	7066	7790	7784
Adj. R2	0.159	0.109	0.169	0.166	0.041	0.183

Source: own computations on RIL data. Notes: *** = 1% significant; ** = 5% significant; * = 10% significant. Robust standard errors in second lines. Controls include a time-trend, managers' educational level, type of ownership (family-based or not), workforce composition by gender, age class, education, occupation (white and blue collars) and type of contract (permanent or temporary), value added per employee, presence in foreign markets, firm's age and size, sector and macro-region.

Table 4. Channels through which unions intervene on skill formation issues

<i>Channels</i>	<i>Goals</i>
Decentralized collective bargaining	<ul style="list-style-type: none"> - Rent-sharing - Claim of greater workers' participation - Internal labor market (not discussed here) - Employment protection
Collective voice face	<ul style="list-style-type: none"> - Recognition of skill gaps and mismatches - Access to financing by bilateral funds - New deciding role within the multi-stakeholder system of bilateral funds
Watch-dog function	<ul style="list-style-type: none"> - Post-training function of monitoring - Employability culture - Inclusive logic

Appendix A. Additional quantitative results

Table A1. Robustness: manufacturing vs. service sectors

	<i>Workplace training (y/n)</i>	<i>Share of trainees</i>	<i>Use of firm funds (y/n)</i>	<i>Log of per- employee cost</i>	<i>Log of per- trainee cost</i>
<i>Manufacture</i>					
Pooled OLS	.122*** (.022)	.070*** (.019)	-.021 (.023)	.700*** (.128)	.823*** (.152)
	3778 - .176	3778 - .104	3776 - .031	3424 - .179	3418 - .181
Fixed effects	.102*** (.037)	.045 (.034)	-.001 (.046)	.694*** (.229)	.497*** (.219)
	3778 - .096	3778 - .119	3776 - .015	3424 - .082	3418 - .032
<i>Services</i>					
Pooled OLS	.107*** (.023)	.088*** (.021)	-.005 (.028)	.695*** (.143)	.718*** (.162)
	3201 - .129	3201 - .102	3198 - .028	2909 - .143	2907 - .138
Fixed effects	.026 (.046)	.021 (.040)	-.013 (.049)	.283 (.297)	.329 (.354)
	3201 - .033	3201 - .055	3198 - .019	2909 - .021	2907 - .025

Source: own computations on RIL data. Notes: *** = 1% significant; ** = 5% significant; * = 10% significant. Robust standard errors in second lines. Number of observations and adjusted R-squared in third lines. Controls include a time-trend, managers' educational level, type of ownership (family-based or not), workforce composition by gender, age class, education, occupation (white and blue collars) and type of contract (permanent or temporary), value added per employee, presence in foreign markets, firm's age and size and macro-region.

Appendix B. Take-outs from interviews to key informants: original Italian texts

[TO-1] *«Noi pensiamo di non doverci confrontare col sindacato sui fabbisogni formativi, la ricerca di determinate competenze o lo sviluppo. È una politica che tradizionalmente si fa in modo unilaterale: ho un bisogno, lo identifico, strutturo un percorso e lo faccio [...]. Ma oltre che spettare tradizionalmente al management, è che le cose vanno così: c'è un problema di tempistiche. [...] Non c'è mai stata un'altra parte in causa».* (Employers' representative)

[TO-2] *«La parte aziendale è la cura delle risorse, quelle umane in particolare. È una prerogativa tipicamente aziendale, cioè non sta nello spazio contrattuale. Questo nella nostra esperienza. [...] Il momento genetico di questa esigenza è tutta dalla parte aziendale. [...] L'azienda predispone tecnologie, materie prime, mercati, cerca di capire e forma le risorse umane, e è sempre stata una leva tipicamente e fisiologicamente aziendale. [...] È nell'esperienza di tutti che l'organizzazione del lavoro passa da una progettazione che sta di qua».* (Employers' representative)

[TO-3] *«La formazione non è contrattazione vera e propria. Voglio dire...quando si parla di contrattazione, si pensa alla contrattazione che avviene periodicamente ogni tre anni, ogni quattro anni. [...] C'è una serie di richieste, un confronto, e un output che è il contratto. [...] Cioè non c'è neanche il tempo per aspettare o discutere di questo. [...] La mattina che noi acquistiamo un sistema gestionale siamo già in ritardo sulla formazione delle persone».* (Employers' representative)

[TO-4] *«Il nostro problema generale, salvo alcuni limitati casi, è che rappresentiamo il livello medio basso. [...] Per cui diciamo che intervenire sulla formazione [...] vorrebbe dire avere dei contatti interni in grado di fare un'analisi e fare una proposta. Ma se tu non hai il confronto con qualcuno interno, cioè per dire un lavoratore che dice: "Caro sindacato io avrei bisogno di questo, questo e questo"... Tu lì fai fatica, almeno per quanto riguarda le categorie industriali».* (Union representative)

[TO-5] *«Io faccio fatica a pensare al Sindacato con la S maiuscola, perché il sindacato nella fabbrica è composta da delle RSU/RSA che sono bravissime persone ma sono persone che...uno fa l'operatore in turno call end, uno operatore turno a caldo, uno è un capo squadra...persone che insomma fanno il loro lavoro, ma nella fase di progettazione della formazione [...] ci lavoriamo noi come azienda. [...] È talmente specifica la formazione che deve essere fatta da persone che vivono questo argomento tutti i giorni». (Human resources manager)*

[TO-6] *«Dopo c'è poi sempre un altro aspetto: la resistenza da parte dei lavoratori sul dire "l'azienda mi fa fare il corso di formazione, ma se dopo non mi dà la categoria perché cavoli lo sto a fare?" [...] C'è resistenza da parte dei lavoratori». (Union representative)*

[TO-7] *«Non c'è disinteresse ma sono meno sensibili. Il lavoratore medio – generalmente – vorrebbe fare sempre il suo mestiere e non essere demansionato. [...] Il cambio di mansione crea in qualche modo...un po' di disagio, quindi rimettersi in aula o fare esperienze crea sempre un pochino di, come dire, di disagio, perché si ha la sensazione, specialmente se sono lavoratori che lavorano lì da molto tempo, di essere rivalutati di nuovo, di dover ricominciare daccapo: "Forse è meglio che lo facciano i giovani, ma perché lo devo fare io?"» (Union representative)*

[TO-8] *«Nella mia esperienza le dico, pure in una azienda che fa del contratto integrativo uno strumento innovativo che va oltre la piattaforma nazionale, da sola l'esigenza di ridurre il mismatch delle competenze non è ancora centrale nell'agenda delle relazioni. Da sola questa esigenza non spinge alla stipula di un contratto integrativo o all'adeguamento di un integrativo. Integrativo oggi si basa ancora sull'organizzazione del lavoro, sulla gestione – nel nostro caso – anche di strumenti innovativi come il welfare aziendale; e in qualche modo favorisce, cioè pone le basi, crea il contesto, [...] all'interno del quale poi l'azienda sviluppa anche quei corsi di formazione che le dicevo». (Human resources manager)*

[TO-9] *«Facciamo anche accordi complessi e infatti la discussione dura molto. [...] Generalmente, è l'esigenza di fare una piattaforma complessiva che porta a discutere anche di formazione. Essa non è diciamo la causa scatenante. Generalmente la causa scatenante in un'azienda [...] è l'orario di lavoro o il salario aggiuntivo. Tutto il resto si crea attorno le prime volte. Quando la contrattazione viene reiterata o rinnovata si riesce anche a specificare. Perché se noi abbiamo un sistema premiante che funziona, un accordo sull'orario che funziona, l'azienda non ha esigenze particolari, possiamo magari dedicarci nell'accordo successivo di più sul punto a, b o c».* (Union representative)

[TO-10] *«Nella piattaforma mettiamo richieste relative alla formazione professionale, alla valorizzazione della polifunzionalità, della polivalenza dei lavoratori, legandola anche ad aumenti retributivi, perché se un lavoratore o una lavoratrice sono maggiormente professionalizzati crediamo che vada valorizzato anche dal punto di vista economico e salariale. [...] La sfida è proprio quella lì. Noi spesso diciamo, il nostro principio è: "Il lavoratore è maggiormente qualificato? Sì? Va inquadrato nel livello più elevato e va pagato di più". La regoletta sarebbe quella. Ci sono aziende, grandi gruppi, dove abbiamo fatto percorsi di analisi dettagliata, le aziende hanno investito e abbiamo fatto inquadramenti professionali che premiavano la professionalità, la maggiore qualifica e anche il salario delle persone. [...] Per cui se riusciamo a condividere il percorso è già un passo di partecipazione non da poco».* (Union representative)

[TO-11] *«Dobbiamo essere competitivi e la formazione è un modo per essere competitivi. [...] Lo mettiamo talvolta negli accordi sui premi di produttività, così le persone hanno anche un vantaggio economico. [...] Negli ultimi anni abbiamo agganciato il premio di alcuni reparti alle ore di formazione».* (Human resources manager)

[TO-12] *«Quel documento lo ha il sindacato e si chiama (Tfor) Technical force. Si tratta di una fotografia dei ruoli professionali necessari per poter ricoprire correttamente i ruoli produttivi. [...] L'organizzazione sindacale è informata di ogni passaggio che viene fatto nei confronti della persona all'interno di questo ambito formativo. [...] Azienda e sindacato avevano stabilito [...] un organigramma di produzione. [...] Abbiamo deciso di*

fare una cosa diversa: fotografiamo l'azienda, definiamo di che cosa ha bisogno l'azienda, ci mettiamo d'accordo insieme su quelli che sono i numeri, poi andiamo a definire come devono essere questi numeri di persone, che contenuti professionali devono avere, che percorsi formativi devono avere e al termine del percorso che livello avranno». (Human resources manager).

[TO-13] *«Generalmente, la contrattazione che cosa può fare? La contrattazione può prevedere percorsi di partecipazione, e [...] può prevedere poco o tantissimo. [...] Può prevedere percorsi di formazione che analizzano i processi produttivi trasversalmente, quindi poi analizzano i fabbisogni formativi dei lavoratori e poi, diciamo, incaricano gli enti preposti di fare la formazione all'interno; può prevedere che il sindacato entri nel monitoraggio della formazione. Però stiamo parlando sempre di una contrattazione e di una relazione industriale molto avanzata». (Union representative)*

[TO-14] *«E abbiamo fatto degli accordi per dire alle aziende di favorire, anche per gestire tutta la partita occupazionale, favorire anche la ricollocazione attraverso riqualificazione. Poi non è che come sindacato siamo entrati nel merito di come viene fatta la riqualificazione e che indirizzo dà eccetera, cioè questa è tutta una partita che viene lasciata in mano all'azienda. Quello che abbiamo detto noi è: "Azienda impegnati, se vuoi gestire questa ristrutturazione impegnati anche a riqualificare le persone per tentare di gestire al meglio l'aspetto occupazionale"». (Union representative)*

[TO-15] *«All'interno di percorsi di ristrutturazione aziendale noi possiamo studiare e confrontarci con la direzione e capire dove va l'azienda. Banalizzo: se un'azienda che fa telefoni, domani mattina fa caldaie, chiaramente dobbiamo cambiare radicalmente la professionalità. [...] Quindi noi rincorriamo generalmente a questa cosa qua e possiamo dire: "Di quali professionalità nuove avete bisogno? Le avete tutte dentro?" – Lo usiamo anche per limitare il licenziamento questo argomento – [...] E se non le avete dentro, siete disposti – noi lo promuoviamo immediatamente – siete disposti a fare percorsi di qualificazione per i vostri dipendenti che non abbiano quelle competenze?" [...] Secondo punto è quello di dire: sappiamo che x lavoratori vengono licenziati, e possiamo prevedere [...] accordi di outplacement, [...] dove uno dei punti è quello di dire che l'azienda si*

impegna a investire su cadauno lavoratore 1.000, 5.000, 10.000 euro, quello che è, quello che si discute...al fine di finanziare percorsi di qualificazione anche attraverso l'outplacement. [...] E poi possiamo fare accordi che coinvolgano le istituzioni su questo, in particolare la regione che ha la maggior parte dei fondi per le politiche attive». (Union representative)

[TO-16] *«Intervistato: “L'attenzione di dire mi serve [la formazione] perché un lavoratore professionalizzato è un lavoratore più sicuro, l'attenzione a quello ce l'hanno [i sindacati] ma non la portano nella contrattazione aziendale perché non è il posto giusto”.*

Intervistatrice: “E quale sarebbe il canale?”

Intervistato: “Beh, le relazioni in azienda ci sono sempre, non ci sono solo nel momento della contrattazione aziendale, per cui i momenti di confronto ci sono. Poi ogni CCNL parte con un sistema informativo: per cui attraverso incontri periodici e così via». (Employers' representative)

[TO-17] *«Io tutti i mesi faccio una riunione sindacale, non aspetto che ci sia il problema, non ci incontriamo quando mi convoca il sindacato. [...] Perciò tutti dobbiamo essere coinvolti e poi ragioniamo anche se ci sono dei problemi che noi non abbiamo percepito e i lavoratori si sono rivolti al sindacato. [...] Durante le riunioni periodiche, (i rappresentanti sindacali) ci possono dare qualche consiglio: c'è un problema con una persona che è un loro iscritto e ritengono che non abbiamo fatto abbastanza perché non ha una buona prestazione ad esempio e mi dicono: “Fagli un supplemento di formazione che è il modo per risolvere in modo positivo i problemi”. Anche loro possono partecipare a queste proposte. [...] Quindi sulla formazione, se ad esempio hanno rilevato che qualche persona ha qualche gap formativo e a noi è sfuggito ce lo propongono». (Human resources manager)*

[TO-18] *«Sulla formazione del capitale umano...sì [...] può esserci un confronto [con il sindacato] e spesso anzi c'è. Ci sono alcune entità paritetiche, tipo Fondimpresa che è un fondo, che richiedono necessariamente il confronto, la partecipazione e condivisione di percorsi formativi [con il sindacato]». (Employers representative)*

[TO-19] *«Lei sa che questi fondi interprofessionali acquistano valore se firmiamo anche noi gli accordi, per cui con le aziende firmiamo parecchi accordi di formazione perché c'è un meccanismo di punteggio che prevede [...] la firma del sindacato, che vuol dire che è condiviso un processo formativo. Quindi a noi capita spesso...».* (Union representative)

[TO-20] *«Mentre la contrattazione aziendale è una sinusoide, ogni tre anni oppure meno si compie, poi aspetta, poi riparte... Ecco l'aspetto della formazione professionale invece è orizzontale, può esserci in qualsiasi momento della vita aziendale. [...] La dinamica contrattuale è fatta in generale da qualcuno che propone e da qualcuno che contropropone o accetta; [...] poi [nella formazione professionale tramite Fondimpresa] il soggetto a cui viene sottoposto il piano formativo è la RSU interna quindi un soggetto diretta espressione dei lavoratori, mentre nella contrattazione in 9 casi su 10 – mi verrebbe da dire in 9,5 su 10 – c'è sempre l'assistenza dell'organizzazione esterna. Non è un momento contrattuale inteso come normalmente lo pensiamo».* (Employers representative)

[TO-21] *«È raro che noi interveniamo nel merito perché sono competenze molto tecniche della azienda, [...] e quindi a me interessa verificare che si continui a dare valore alla formazione e non si faccia il contrario. [...] Noi vorremmo rafforzare la cultura della formazione però se le persone vivono queste esperienze come negative, si crea una condizione contraria, dove le persone dicono: “No lascia perdere che ho provato una volta ed era una schifezza, ho solo perso tempo, mi sono annoiato”».* (Union representative)

[TO-22] *«Cioè, vuol dire che se fanno fare i corsi di formazione che però non sono finalizzati a pagare di più, in sostanza.... Invece tu potresti dire: “Sì, l'obiettivo è anche quello, ma è anche quello appunto di darti delle competenze aggiuntive che ti possono essere d'aiuto per conservare il posto di lavoro che hai”. Ma questo non è proprio facile farlo passare come un messaggio».* (Union representative)

[TO-23] *«Questi lunghissimi anni di crisi hanno fatto vedere che la polivalenza funzionale è un valore aggiunto su tutto. E il lavoratore più professionalizzato è quello che è anche*

più difendibile. O più rispondibile. In questo, il sindacato e le aziende più evolute sono assolutamente in sintonia. Il sindacato perché ha un lavoratore che è più forte sul mercato del lavoro; l'azienda perché ha un lavoratore che accompagna meglio la flessibilità organizzativa». (Employers representative)

[TO-24] *«...però diciamo che le aziende sono più portate a orientare questo tipo di formazione sulle fasce...sui livelli alti, non sulla base operaia; oppure, sulla base operaia, propongono i corsi che sono obbligatori per legge, cioè quelli sulla sicurezza; mentre per i livelli più alti è un tema che vogliono un po' gestire in proprio, cioè, sono un po' restii a discuterne. Infatti quello lì è il punto: normalmente nella formazione quello che diciamo noi è: “Se stavolta faranno i corsi i quadri, la prossima volta lo faranno altri”. [...] Le aziende puntano su quelli. E lì la discussione che si fa è “Cerchiamo di coinvolgere anche gli altri, di preparare qualcosa che abbia un interesse per i livelli che rappresentiamo di più”».* (Union representative)

[TO-25] *Talvolta si arriva a un confronto, una volta all'anno, in cui l'azienda sulla base di una propria analisi dice: “Vorrei fare questo tipo di formazione...” E il sindacato – le RSU/RSA – dicono sulla base di una loro analisi: “No, secondo noi, oltre a quello che dite voi ci sarebbe anche la necessità di fare corsi di questo tipo nel tal reparto”, e via dicendo. Questo per evitare che finisca tutto a corsi di Word, Excel e inglese che lasciano un po' il tempo che trovano. [...] Se c'è la condivisione di questo percorso, la condivisione dei piani e la spiegazione ai lavoratori su quali saranno le aree di intervento della formazione, è già una buona partenza”.* (Union representative)

Appendix C. Definition of variables

Table C1. Definition of variables

<i>Labels</i>	<i>Description</i>
<i>Main variables</i>	
Training	Dummy variable that equals to 1 if firms provides workplace training to their employees, 0 otherwise
% trained employees	Share of trained on the firms' total number of employees
Private-funded training	Dummy variable that equals to 1 if firms financed workplace training with their own funds, 0 otherwise
Use of bilateral funds	Dummy variable that equals to 1 if firms financed workplace training with (external) bilateral funds, 0 otherwise
Cost of training per employee	Log of total amount of training costs (in Euros) per employee. The amount of training costs is deflated
Cost of training per trained worker	Log of total amount of training costs (in Euros) per employee. The amount of training costs is deflated
Union	Dummy variable that equals to 1 if there exists a workplace body of workers' representatives (RSU/RSA) at firm level, 0 otherwise
Firm - level bargaining	Dummy variable that equals 1 if a firm-level agreement has been signed, 0 otherwise
<i>Other variables related to management and corporate governance</i>	
Managers' education	Three dummy variables that equals to 1 whether the educational level of the employers/managers who run the firm is: i) tertiary; ii) upper secondary iii) lower secondary or elementary (0 otherwise)
Family firm	Dummy variable that equals to 1 if the ownership of the firm is held by a single family, 0 otherwise
<i>Other workforce characteristics</i>	
Education	Three variables indicating the share of employees (on the firms' total number of employees) with: i) tertiary education; ii) upper secondary education; iii) lower secondary or elementary
Age	Three variables indicating the share of employees (on the firms' total number of employees) with: i) less than 40 years old; ii) between 40 and 49 years old; iii) more than 49 years old
Occupation	Three variables indicating the share (on the firms' total number of employees) of: i) executives, ii) white collars and iii) blue collars
Temporary workers	Share of employees with a fixed-term contract (of any kind) on the firms' total number of employees
Female	Share of female workers on the firms' total number of employees
Net job turnover rate	Difference between the total hirings and total separations, on the firms' total number of employees
<i>Other firm's characteristics</i>	
Profitability	Log of the total sales (in Euros) per employee. The amount of sales is deflated
Innovation	Dummy variable that equals to 1 if the firm has invested in product or process innovation during the three years before the survey, 0 otherwise

International trade	Dummy variable that equals to 1 if the firm operates in foreign markets, 0 otherwise
Firm's size	Log of total number of employees
Firms' age	Number of years during which the firm has operated
Geography	20 dummies variables indicating the Italian Nuts 2 regions
Sector	10 dummies variables indicating: electricity, gas and water distribution (public utilities); food, textile, tobacco, etc.; chemistry, metallurgy, etc.; mechanics and other manufacturing goods; construction; retail and wholesale, tourism, hotels and restaurants; transportation; insurance and financial intermediation, information and communication; other business services, healthcare, educational and social services; others.

Source: RIL Data 2010-15. Note: to deflate all monetary variables we relied on sectoral deflators (NACE 2 digit) provided by the National Statistical Institute (ISTAT) based on industrial production prices (the base year is 2010). The deflators are available at: <http://dati.istat.it/#>.